

# PATENT SPECIFICATION

DRAWINGS ATTACHED

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## COMPLETE SPECIFICATION

### Improvements in Change-speed Gearboxes

We, ROBERT BOSCH GMBH, a German Company of 4, Breitscheidstrasse, Stuttgart-W, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a change-speed gearbox, such as a vehicle gearbox, having a gear-change mechanism coupled to a gear-change member of the gearbox for remotely engaging and changing gear.

For changing the gears of a gearbox, it is already known to provide two separate hydraulic or pneumatic double-acting cylinders arranged at right angles to each other for selecting the plane of movement of the gear-change-member and for engaging the gears respectively, said cylinders effecting the transverse and longitudinal movements respectively of the gear-change member of the gearbox. A straight slide block is secured to the piston rod of each of the pistons of these cylinders so that the two slide blocks cross each other at right angles and the gear-change member passes through the slide blocks at this point of intersection. The various movements of the gear-change member for changing gear are effected by a precisely controlled introduction of a pressure medium into the double-acting cylinders. These known gear-change mechanisms accordingly require many individual valves and pressure medium conduits, in addition to a pressure generator, corresponding to the number of speed gears of the gear box.

According to the present invention a change-speed gearbox has a gear-change member guided in a straight slot in a slide block of a gear-change mechanism, said gear-change member being movable transversely to the direction of said slot by means of the slide block from one gear-change member operating plane to another and being itself movable

longitudinally in said slot for engaging the gears and said gear-change mechanism further comprising a crank drive connected to the gear-change member for effecting its longitudinal movement to engage an appropriate gear.

Conveniently the slide block is connected to a cam drive for effecting displacement of the slide block transversely to the direction of said slot.

Preferably the gear-change mechanism comprises a crank drive and a cam drive connected together so that they are actuated by a common motor, for example, an electric motor, if desired by way of a reduction gear.

This embodiment of the present invention has the advantage that only one driving motor is necessary for carrying out the gear-change movements and therefore the control of the gearbox as a whole is simple. In addition, the gearbox of preferred construction in accordance with the present invention offers a further advantage that the driving force of the motor need only be very low, since powerful operating forces occur at the beginning and end of the stroke of the crank drive, that is to say in an area where the drive movement is greatly reduced.

The invention will be further described, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a side view of a gear box with a gear change mechanism constructed in accordance with the present invention;

Fig. 2 is a schematic plan view of the gear change mechanism shown in Fig. 1; and

Fig. 3 is a similar schematic plan view of another embodiment of gear change mechanism for a gear box.

Referring to Figs. 1 and 2 of the drawings, a gear box 11 of a vehicle transmission is flange-mounted on an internal combustion engine 10 (merely indicated) and is provided

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